Allied Paper, Inc./Portage Creek/Kalamazoo River

966688

Area 3

Proposed Plan Meeting

July 15, 2021

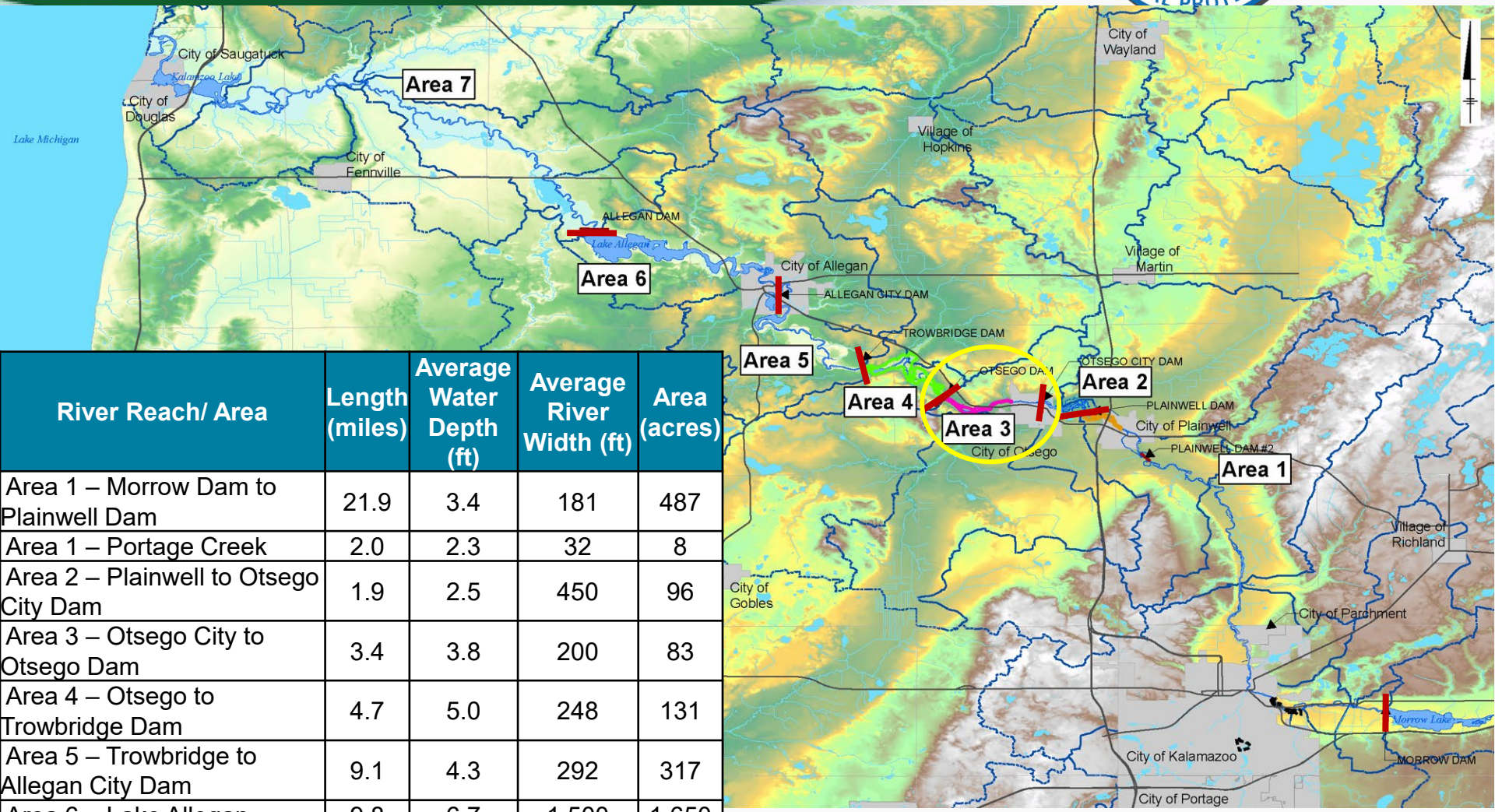
Remedial Process

- Provide information on EPA's proposed remedy for Area 3 of Operable Unit 5
- EPA receives comments during 30-day period
- EPA responds to comments in the Responsiveness Summary
- EPA finalizes remedy in Record of Decision (Fall 2021)

Allied Paper, Inc./Portage Creek/Kalamazoo River Superfund Site

- Operable Unit 1: Allied Paper Landfill
- Operable Unit 2: Willow Boulevard and A-Site Landfill
- Operable Unit 3: King Highway Landfill
- Operable Unit 4: 12th Street Landfill
- Operable Unit 5: Portage Creek and 80 miles of Kalamazoo River
- Georgia Pacific/Hawthorn Mill Properties
- Operable Unit 7: Plainwell Mill Property

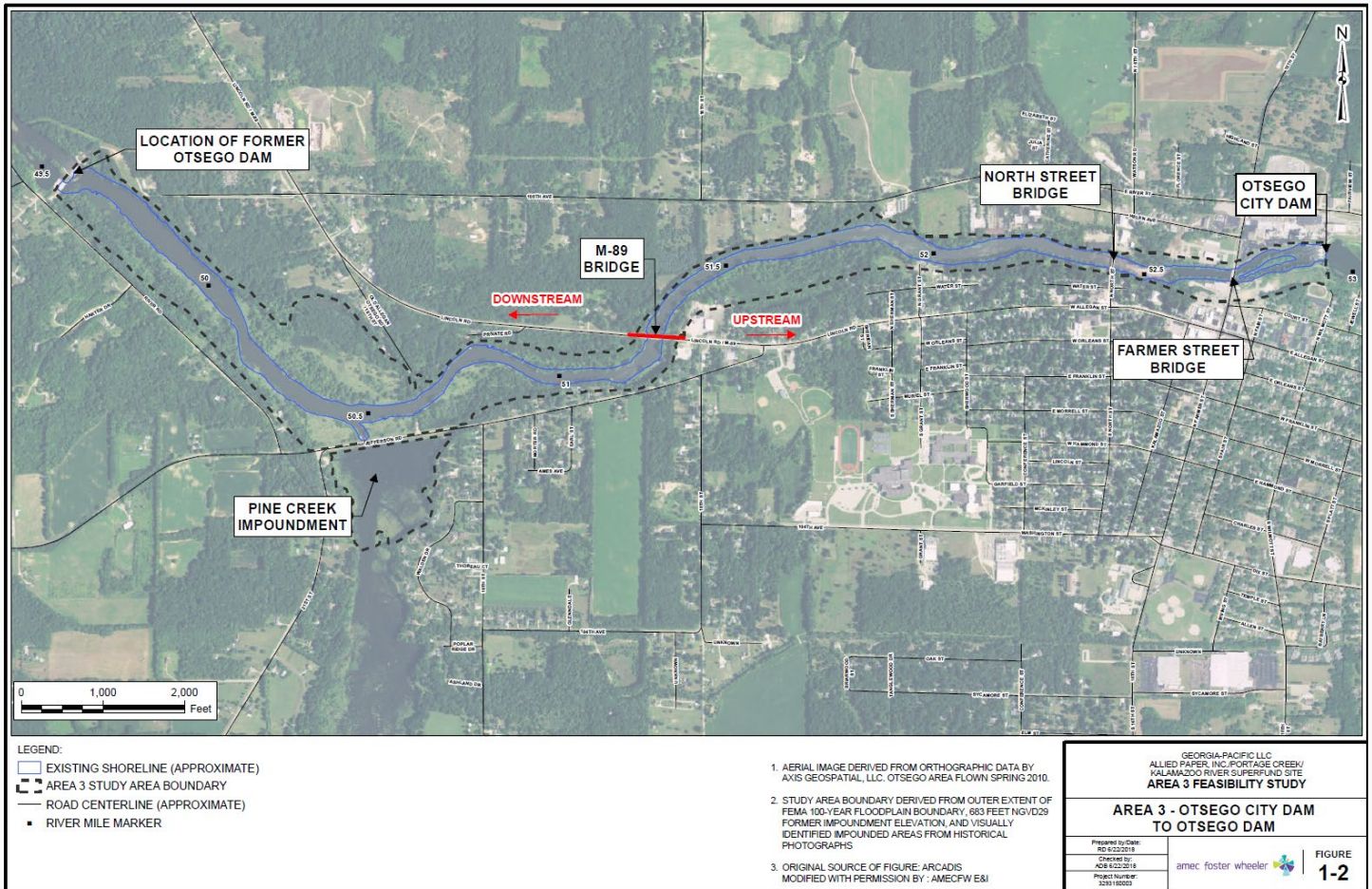
The Seven Areas of Operable Unit 5 (The Kalamazoo River and Portage Creek)



River Reach/ Area	Length (miles)	Average Water Depth (ft)	Average River Width (ft)	Area (acres)
Area 1 – Morrow Dam to Plainwell Dam	21.9	3.4	181	487
Area 1 – Portage Creek	2.0	2.3	32	8
Area 2 – Plainwell to Otsego City Dam	1.9	2.5	450	96
Area 3 – Otsego City to Otsego Dam	3.4	3.8	200	83
Area 4 – Otsego to Trowbridge Dam	4.7	5.0	248	131
Area 5 – Trowbridge to Allegan City Dam	9.1	4.3	292	317
Area 6 – Lake Allegan	9.8	6.7	1,500	1,650
Area 7 – Allegan Dam to Lake Michigan	26	5.5	212	670

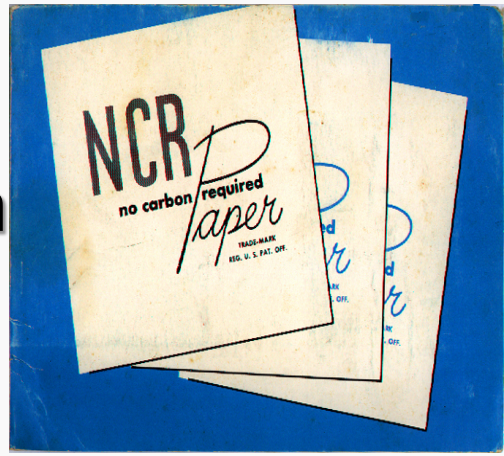
Area 3
Kalamazoo River

- **3.4 miles**
- **3.8 feet average depth**

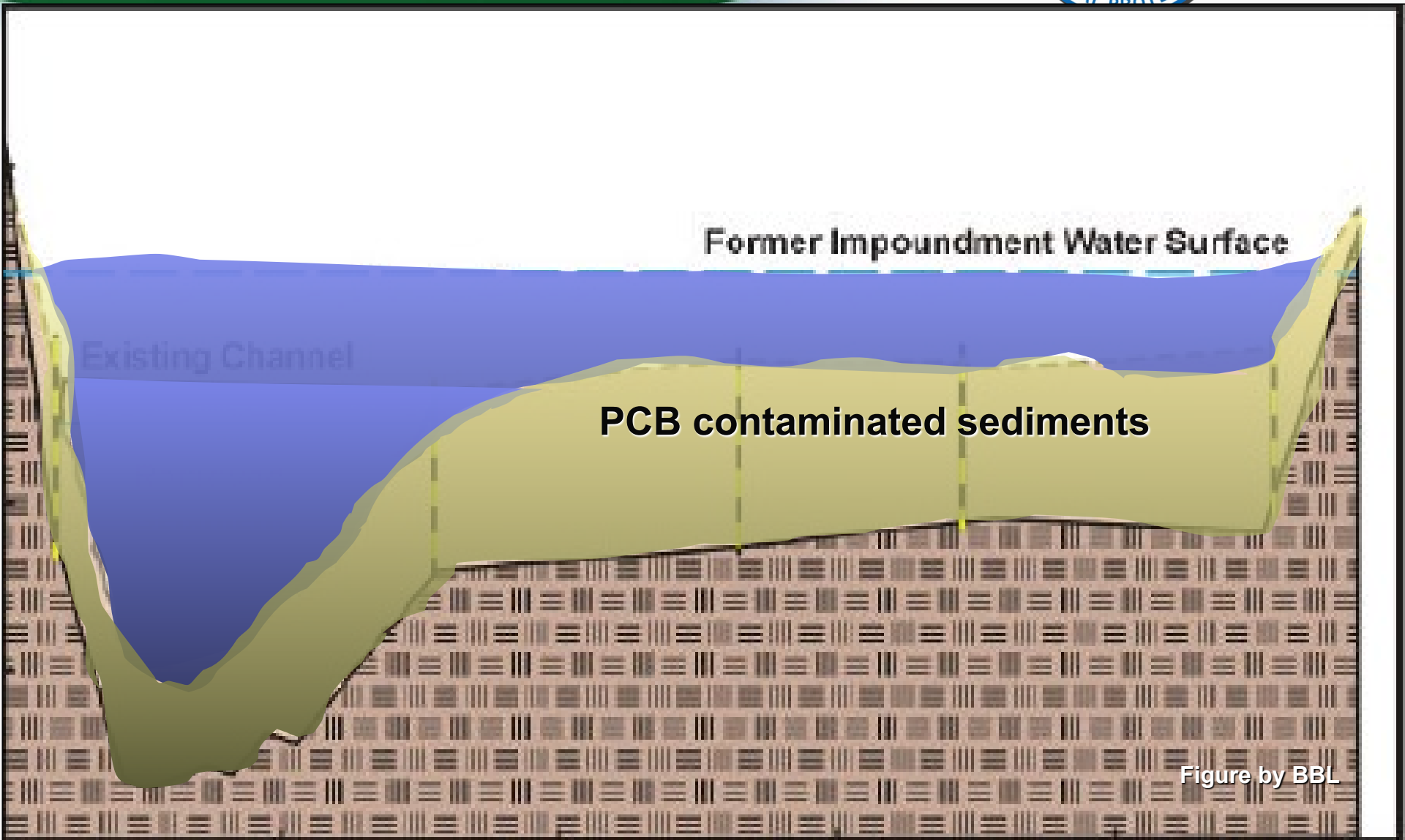


Conceptual Site Model

- PCBs from recycling of carbonless copy paper 1950s-1970s
- Primary human health exposure pathway through fish consumption
- Ecological exposure pathway to exposed floodplain soils
- The ongoing, uncontrolled erosion of contaminated paper wastes and soils from the river banks is the most significant source of PCB loading to the Kalamazoo River.



Pre- and Post-Dam Water Levels



Remedial Action Objectives

- **RAO 1: Protect people who consume Area 3 Kalamazoo River fish from exposure to PCBs that exceed protective levels. The RAO is expected to be progressively achieved over time by meeting the following targets for fish tissue and sediment.**
  - **Fish Tissue Targets**
    - **A reduction in fish tissue to the Michigan fish advisory level for smallmouth bass to two meals per month (0.11 mg/kg total PCBs) within 30 years.**
    - **Achieve a non-cancer hazard index (HI) of 1.0 and a 10^{-5} cancer risk within 30 years for the high-end sport angler (100% bass diet;125 meals/year)**
  - **Sediment Target**
    - **A SWAC of 0.33 mg/kg or less in Area 3 of the Kalamazoo River following completion of the remedial action**

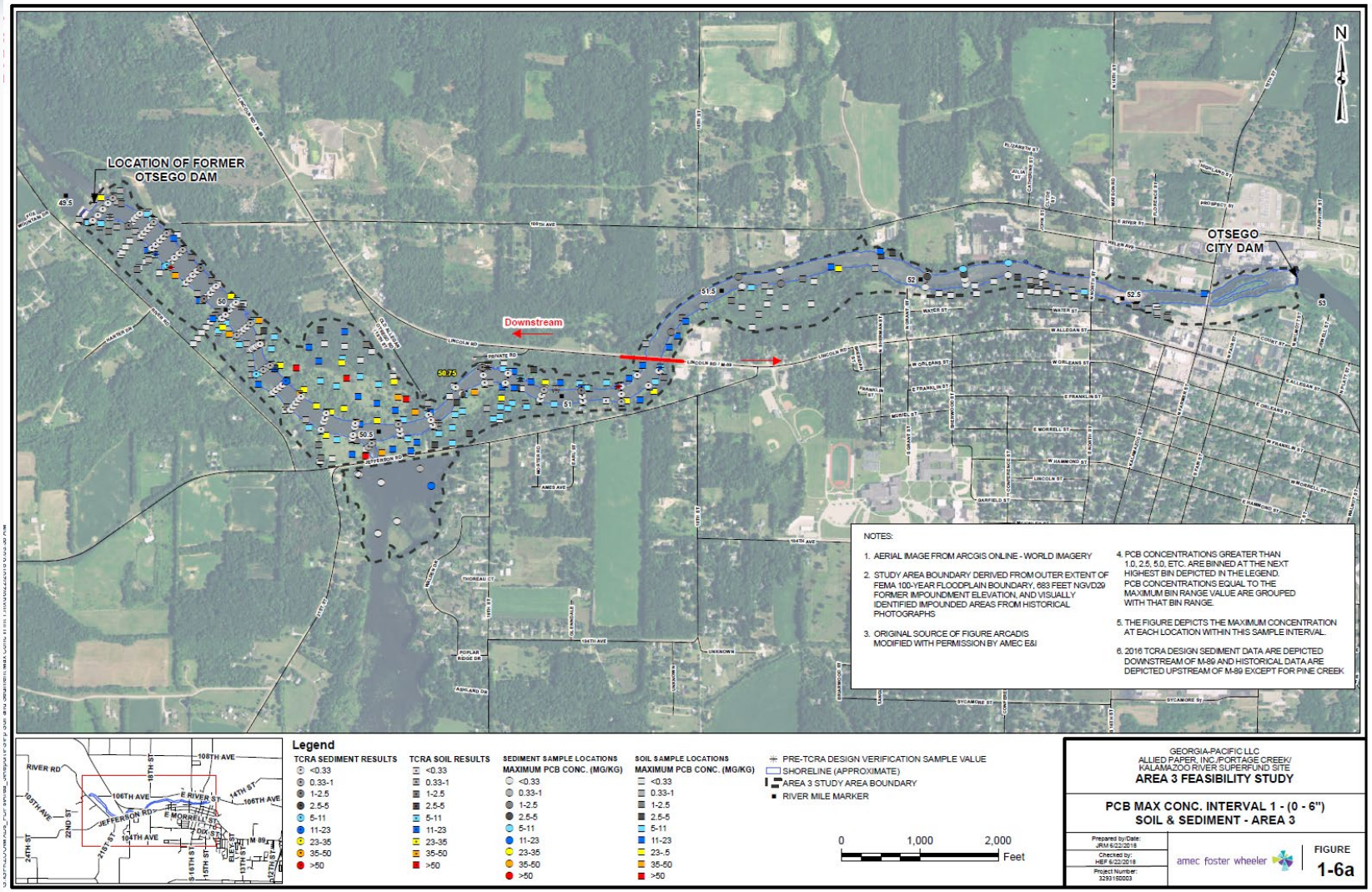
Remedial Action Objectives

- **RAO 2: Protect aquatic ecological receptors from exposure to concentrations of PCBs in sediments that exceed protective levels for local populations.**
- **RAO 3: Protect terrestrial ecological receptors from exposure to concentrations of PCBs in soils that exceed protective levels.**
- **RAO 4: Reduce the transport of PCBs from Area 3 to downstream areas of the Kalamazoo and Lake Michigan.**
- **RAO 5: Protect people that reside in Area 3 from exposure to PCBs and Dioxins that exceed protective levels.**

Preliminary Remediation Goals

- **Fish tissue: PRG range of 0.042 to 0.187 mg/kg**
- **Sediment (SWAC 0.33 mg/kg)**
- **Floodplain soil (0-24"):**
  - **2.5 mg/kg residential**
    (24 hours/day for 30 years; 245 days/year dermal and 350 days/year ingestion and inhalation)
  - **11 mg/kg ecological**
  - **23 mg/kg recreational**
    (128 days/year for 24 years; 24 hours/day dermal and ingestion and 4 hours/day inhalation)

Area 3 Surface PCB Concentrations

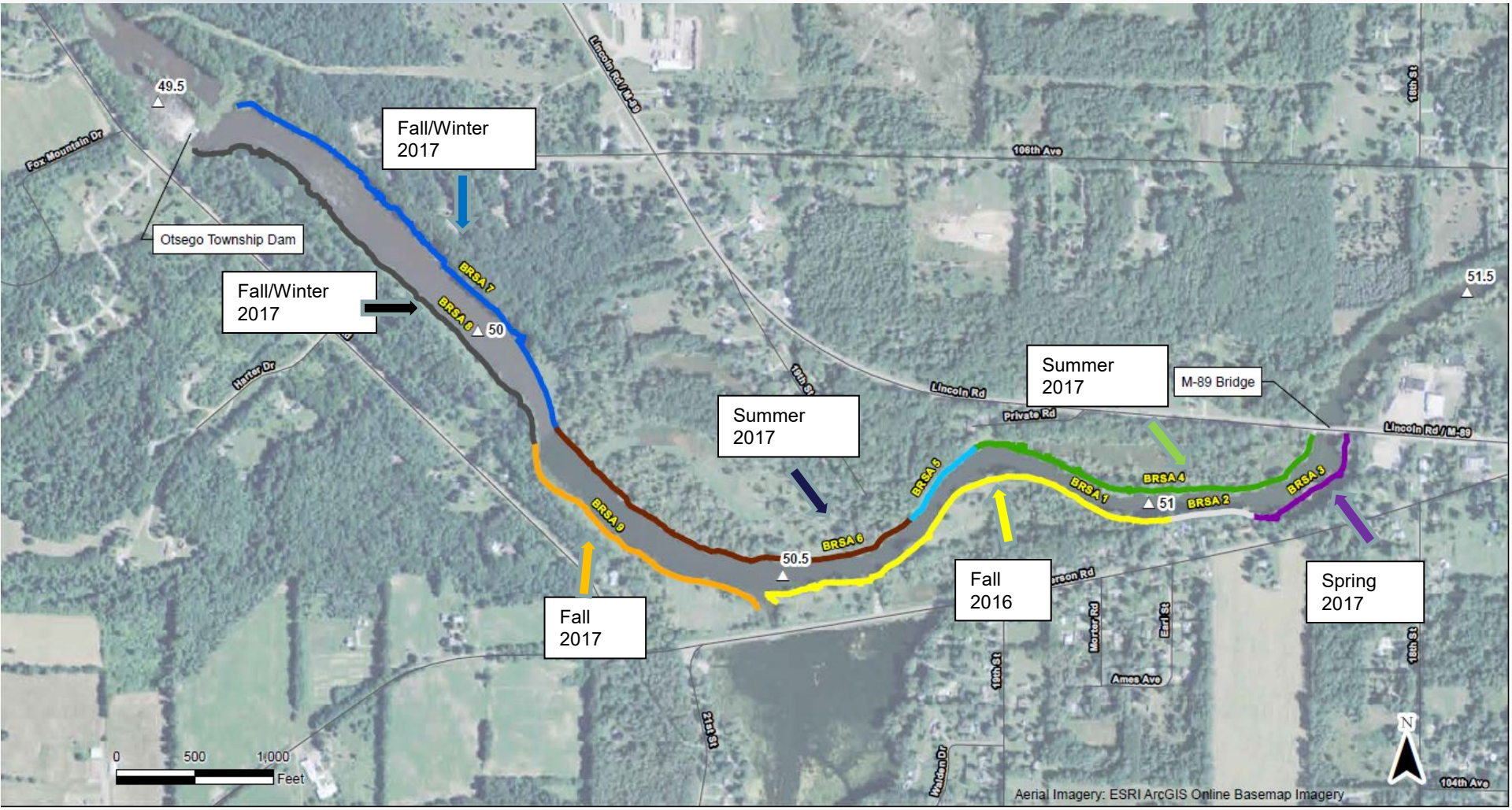


Otsego Dam

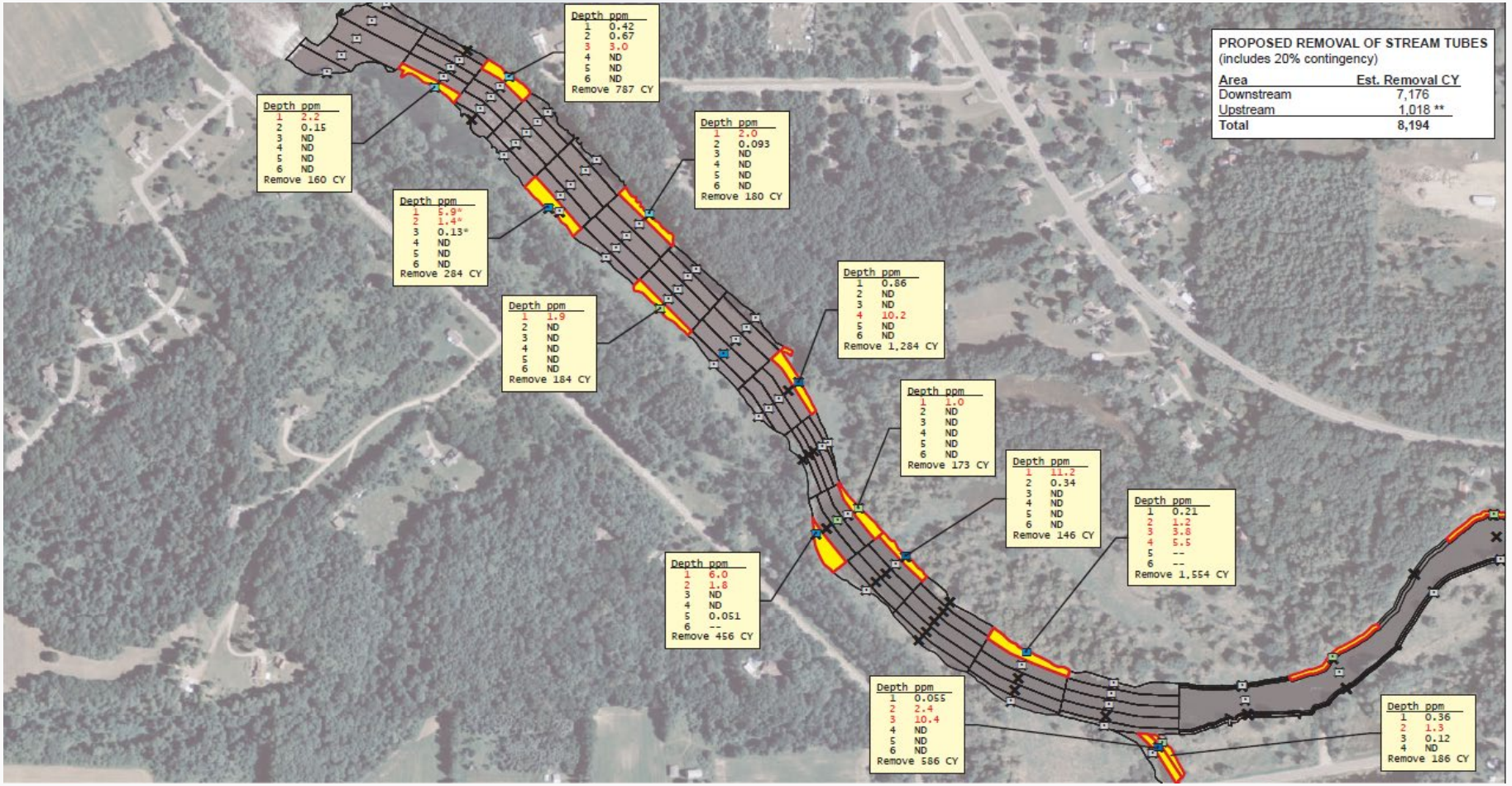
Area 3 Time-Critical Removal Action

- **2016-2018**
- **UAO with Georgia-Pacific, Weyerhaeuser and International Paper**

Bank Soil Removal Approach

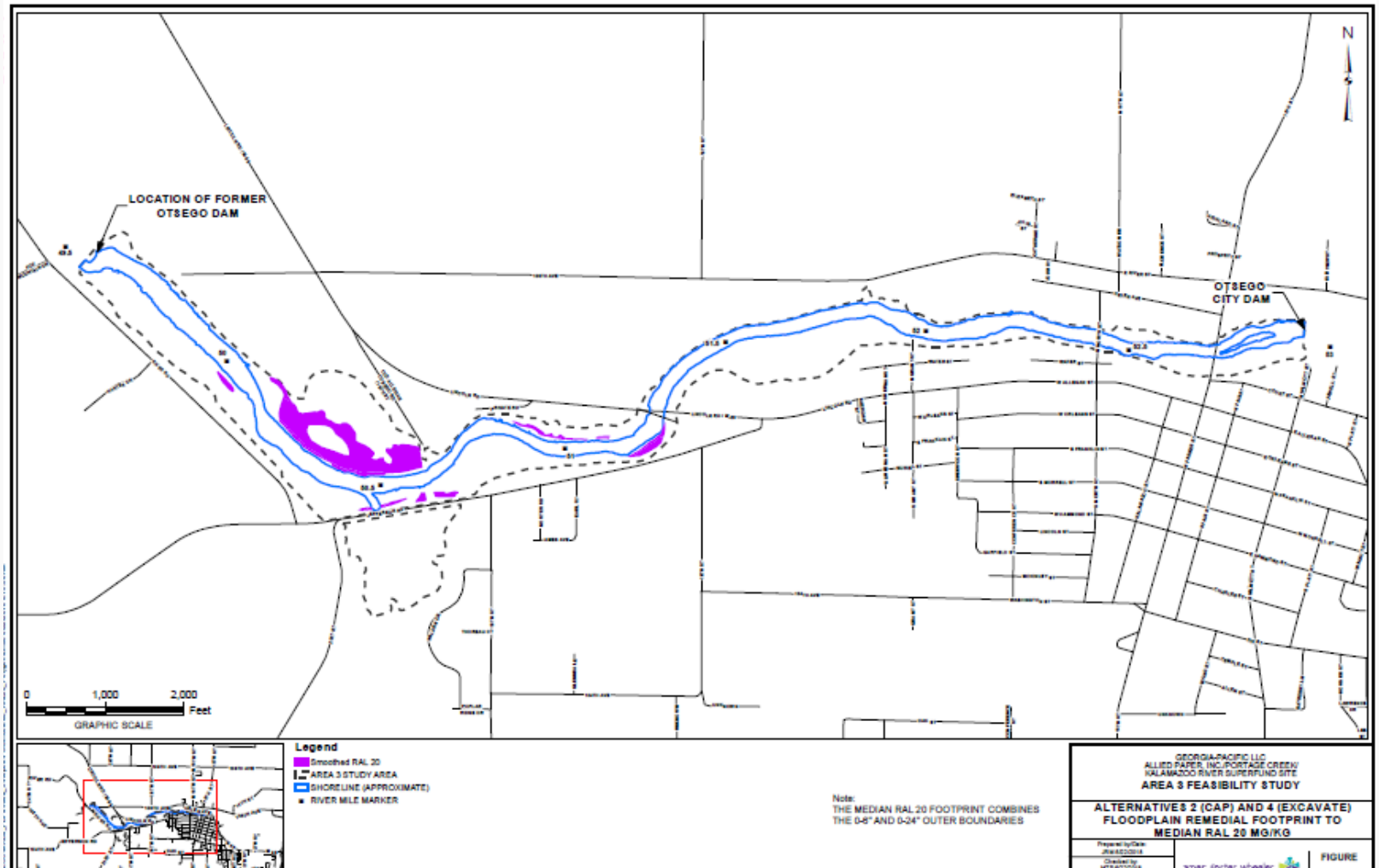


Sediment Removal Approach

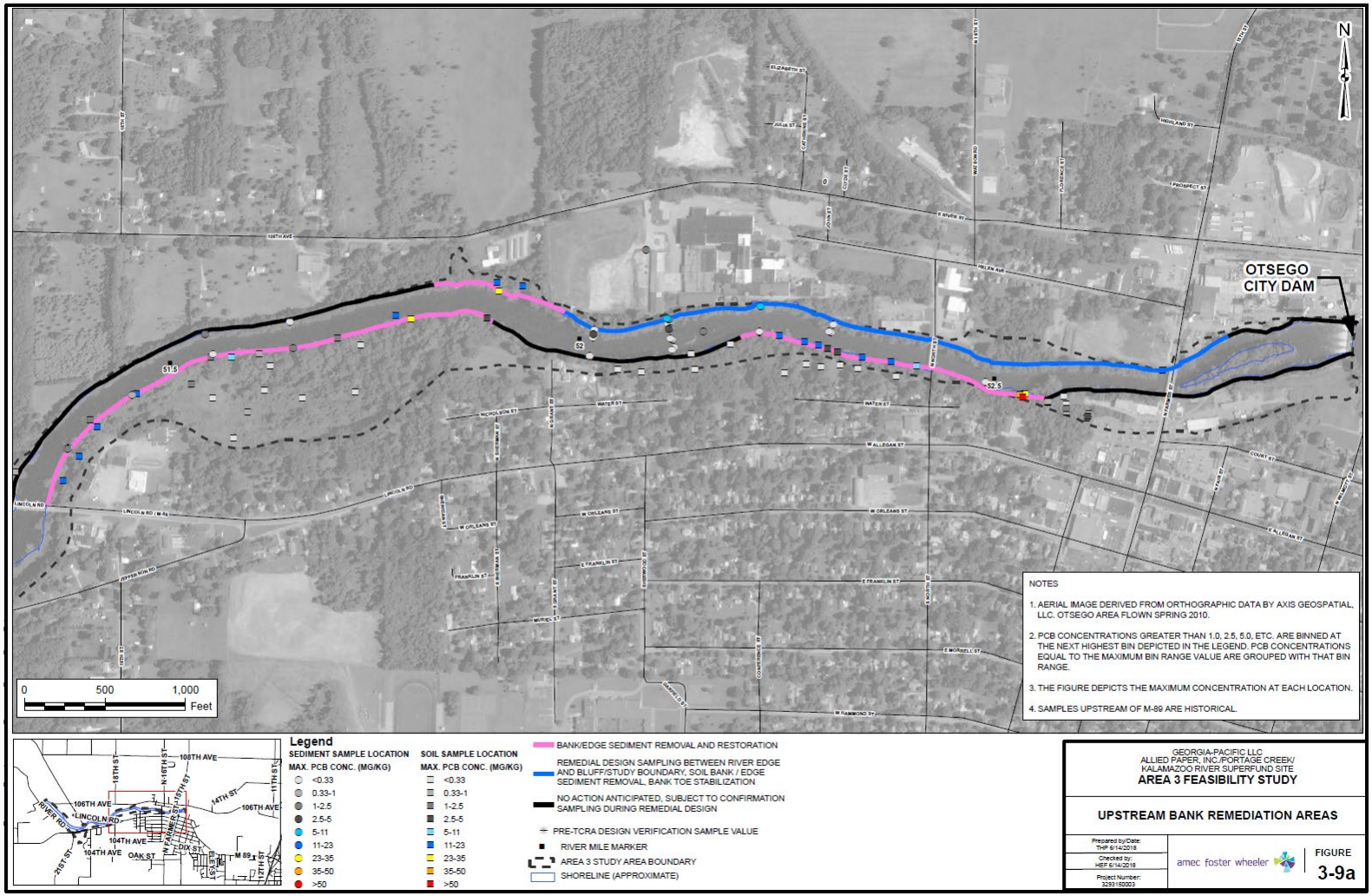


Free-Flowing Channel Restored

Area 3: Downstream Remediation Footprint



Area 3: Upstream Remediation Areas



Area 3 Remedial Alternatives

1. No Action (No further action beyond TCRA)
2. Capping: $26.3M
3. Combination of Capping and Excavation: $28.7M
4. Excavation: $33.4M
5. Aggressive Excavation (PRG 0.33 mg/kg): $116M

Common Elements of Alternatives 2 through 4

- No Further Action in the TCRA Areas
- Remedial Design Sampling to Confirm Remedial Footprints
- Upstream Focused Bank/Edge Sediment Removal and Bank Protection and Restoration
- Removal of TSCA Media Exceeding 50 mg/kg PCBs
- Pine Creek MNR
- Long-Term Monitoring and Maintenance (to fish tissue PRGs)
- Institutional Controls and/or capping/removal for private parcels

Superfund Evaluation Criteria

Threshold Criteria

- Protection of human health and the environment
- Compliance with Applicable or Relevant and Appropriate Requirements (ARARS)

Balancing Criteria

- Implementability
- Long-term effectiveness and permanence
- Short-term effectiveness
- Preference for treatment
- Cost effectiveness

Modifying Criteria

- State acceptance
- Community acceptance

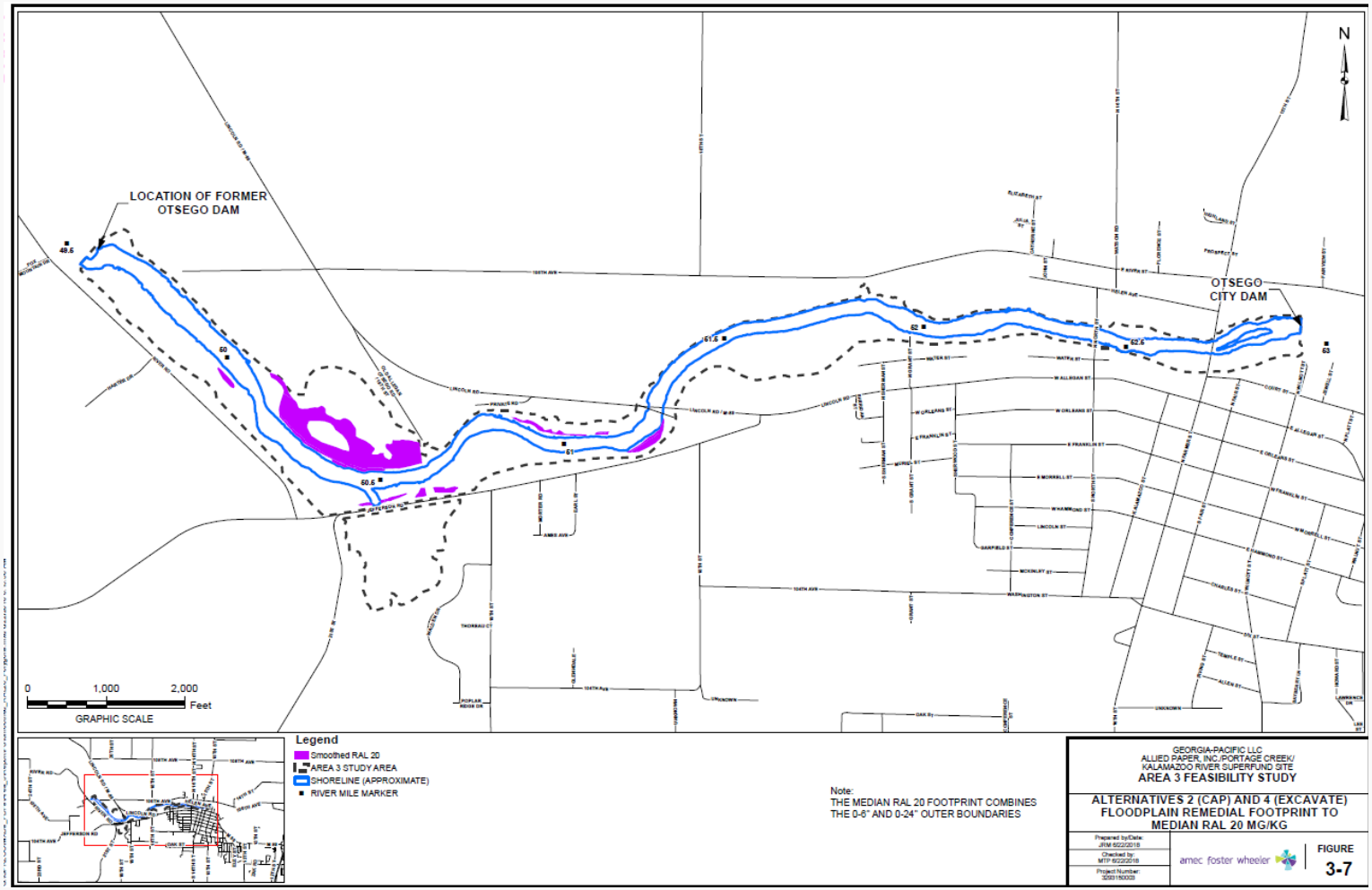
Alternative Evaluation Summary

Alternative	Capping Area (acres) / Removal Volume (cy)	Years to Reach PRGs for Smallmouth Bass	Overall Protection of Human Health and the Environment	Compliance with ARARs	Short-term Effectiveness	Long-term Effectiveness	Reduction of Toxicity, Mobility, and Volume Through Treatment	Implementability	Total Present Worth Cost
1: No Action	None	34	Undocumented	Undocumented	Not Effective	Undocumented	No treatment	Nothing to implement	$0
2: Capping of floodplain soil exceeding RAL-20 outside of TCRA areas, targeted excavation, upstream bank soil/sediment edge excavation with bank protection and restoration ECs, Pine Creek MNR, ICs, capping and/or ICs or excavation for private recreational parcels, and LTM	18.1 / 11,300	33	Protective, reasonable timeframe	Complies	Effective	Effective	No treatment	Readily implementable	$26,300,000
3: Combination of capping and excavation of floodplain soil exceeding RAL-20 outside of TCRA areas, targeted excavation, upstream bank soil/sediment edge excavation with bank protection and restoration ECs, Pine Creek MNR, ICs, capping and/or ICs or excavation for private recreational parcels, and LTM	15.8 / 20,100	33	Protective, reasonable timeframe	Complies	Effective	Effective	No treatment	Readily implementable	$28,700,000
4: Excavation and backfill of floodplain soil exceeding RAL-20 outside of TCRA areas, targeted excavation, upstream bank soil/sediment edge excavation with bank protection and restoration ECs, Pine Creek MNR, ICs, capping and/or ICs or excavation for private recreational parcels, and LTM	69,800	33	Protective, reasonable timeframe	Complies	Effective	Effective	No treatment	Readily implementable	$33,400,000
5: Aggressive excavation and backfill of areas exceeding a RAL of 0.33 mg/kg for floodplain and bank soil outside of TCRA areas, Pine Creek Impoundment excavation, channel sediment edge excavation, restoration of bank/upland excavated areas, and LTM	522,000	36	Protective, longer timeframe, extensive habitat destruction	Compliance delayed	Not Effective	Effective	No treatment	Requires Extensive effort	$116,000,000

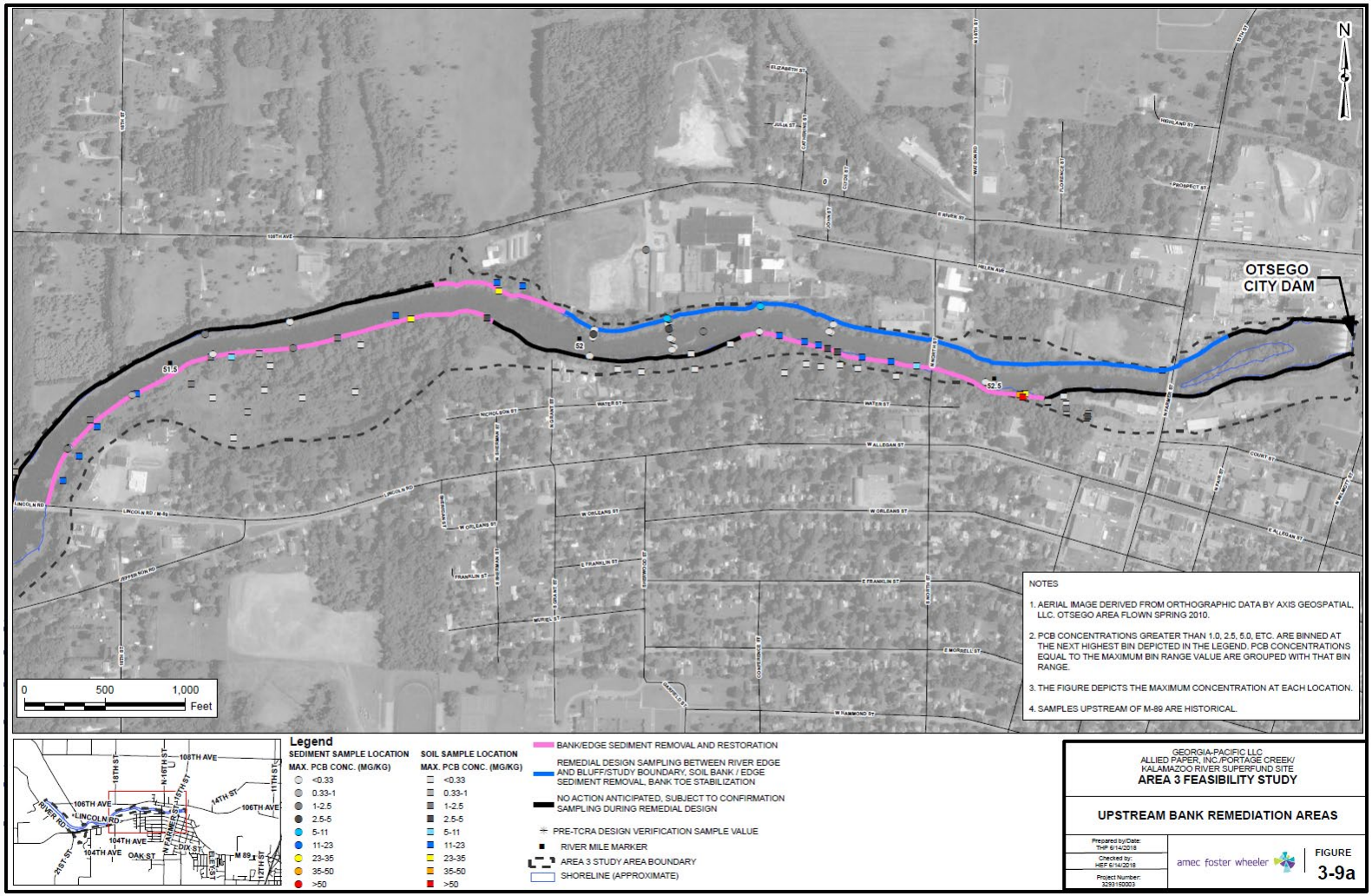
EPA Preferred Alternative 4

Excavation of approximately 58,500 cy of floodplain soil downstream of the M-89 Bridge, and 11,300 cy of bank soil/edge sediment along 6,600 feet of the Area 3 channel upstream of the M-89 Bridge.

$33.4M



Area 3, Alternative 4: Upstream Remediation Areas



EPA's Preferred Alternative 4

- No further action in the completed TCRA areas;
- RD sampling as approved by EPA;
- Excavation and backfill of floodplain soil exceeding RAL-20 outside of TCRA areas;
- Targeted media excavation exceeding 50 mg/kg PCBs;
- Upstream bank soil/sediment edge excavation, with bank protection and restoration ECs;
- Transportation of excavated contaminated media to appropriate, approved landfills for off-site disposal;
- Pine Creek MNR, and area-wide LTM and maintenance including area-wide monitoring of fish, sediment, surface water, and bank maintenance (33 years/PRGs); and
- 2 years to implement remedy

Next Steps

- Questions/Comments
- Comments to be incorporated into the responsiveness summary
- EPA evaluates comments and finalizes remedy in a Record of Decision (Fall 2021)

Questions?

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www.epa.gov/superfund/allied-paper-kalamazoo